

**Louisiana Offshore Terminal Authority Environmental Monitoring
2001-2002 Marine/Estuarine**

by

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ABSTRACT

The current Louisiana Offshore Oil Port (LOOP) monitoring program includes seasonal monitoring of aquatic and marine resources, sediment composition, and water quality on a five-year cycle. These data provide an update to the existing long-term LOOP dataset that was collected annually from 1979 to 1994, as well as a measure of natural environmental variability in the project area. The monitoring program was designed to identify environmental impacts that could occur due to offshore vessel operations (at the Single-Point Mooring and Terminal Complex), brine discharge, storage facility operations, and pipeline construction and operation. Inshore benthic samples were collected utilizing a 0.023 m² Ekman grab sampler. Five replicates were collected at each inshore Lake Jesse and Clovelly station. Offshore samples were collected with a 0.1 m² Smith-McIntyre grab sampler. There were six replicates collected at each station adjacent to the LOOP brine diffuser and seven replicates collected at each station in the area of the LOOP Marine Terminal Complex (offshore). Samples were collected during August and November 2001 and June 2002. Environmental data and hydrographic profiles were conducted in conjunction with the benthic sampling. Sediment core samples were collected at the inshore benthic stations using a Barret-type coring device. Sediment core samples collected at the offshore benthic stations were collected using a Smith-McIntyre Grab sampler. Samples were analyzed for Polynuclear Aromatic Hydrocarbons (PAH) and grain size (percent gravel, sand, silt, clay).

Sediments at the Clovelly stations during all seasons were dominated by silt+clay (except Station 464 in June). Sediments at Station 464 were greater than 20% sand during

August and November, but were completely organic during June. Estuarine salinities were present during all seasons, ranging from < 2 ppt in August to 6 ppt in June. Dissolved oxygen (DO) levels varied seasonally. DO levels were lowest in August (< 5 mg/l) and were greater than 7 mg/l during November and June. The gastropod, *Probythinella louisiana*, dominated the benthic assemblage in August, the gastropod, *Amnicola limosa*, dominated in November, and the bivalve, *Mytilopsis leucophaeata*, dominated in June. There were significant differences in density and taxa richness between stations for each season. In no instance was the control station significantly different than both of the test stations. These differences could be explained by subtle variations in sediment type between stations as well as stochastic variability inherent in benthic assessments. There was no measurable impact of the LOOP facilities on benthic macroinfaunal assemblages at the Clovelly site.

Sediments at the Lake Jesse stations during all seasons were dominated by silt+clay. Estuarine salinities were present during all seasons, ranging from 4.7 ppt in August to 6.8 ppt in November. DO levels did not vary seasonally and were between 7 and 8 mg/l during all sampling events. The oligochaete family, Tubificidae (LPIL), dominated the benthic assemblage in August, the polychaete, *Mediomastus* (LPIL), dominated in November, and the ascidiacean family, Ascidiacea (LPIL), dominated the assemblage in June. There were no significant differences in density or taxa richness between stations for each season. There was no measurable impact of the LOOP facilities on benthic macroinfaunal assemblages at the Lake Jesse site.

Sediments at the Brine Diffuser stations during all seasons were dominated by silt + clay. The sediment at Station 475 in August was 45% sand. Bottom salinities varied

seasonally and were between 28-30 ppt in August, 31-32 ppt in November, and 35-36 ppt in June. Hypoxic conditions (DO = 1.88 mg/l) were present at Station 435 during August; however, DO levels at the remaining stations ranged from 2.79 mg/l at Station 473 to 3.66 mg/l at Station 475. In November, bottom DO levels ranged from 4.8 mg/l at Station 475 to 7.1 mg/l at Station 435. In June, hypoxic conditions were present at all stations with DO ranging from 1.0 mg/l at Station 475 to 1.5 mg/l at Stations 435 and 474. The polychaete, *Paraprionospio pinnata*, dominated the benthic assemblage in August and November, while the polychaete, *Mediomastus* (LPIL), dominated the benthos in June. There were no significant differences in densities between stations for each season. There were no significant differences in taxa richness between stations during August and November; in June, Station 435 had significantly greater taxa richness than the remaining stations. It is probable that the hypoxia experienced by the benthic assemblage in June was responsible for variations in taxa richness. There was no measurable impact of the LOOP facilities on benthic macroinfaunal assemblages at the Brine Diffuser site.

Sediments at the Offshore stations during all seasons were dominated by silt + clay. Bottom salinities varied seasonally and ranged from 32.4 ppt at Station 481 in August to 38.6 ppt at Station 484 in August. Hypoxic conditions were present at Stations 481 (DO = 1.60 mg/l) and 484 (DO = 1.88 mg/l) during August; no bottom DO data were collected from Station 484. In November, bottom DO levels ranged from 2.8 mg/l at Station 481 to 8.1 mg/l at Station 482. In June, bottom DO levels ranged from 6.0 mg/l at Station 482 to 6.9 mg/l at Station 484. The polychaete, *Paraprionospio pinnata*, dominated the benthic assemblage in August and June, while the gastropod, *Vitrinella helicoidea*, dominated the

benthos in November. There were significant differences in density and taxa richness between stations in August and November. Station 481 had significantly higher density and taxa richness than Stations 482 and 484. There were no significant differences in density and taxa richness between stations in June. There was no measurable impact of the LOOP facilities on benthic macroinfaunal assemblages at the Offshore site.

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